



THE COMMONWEALTH OF MASSACHUSETTS  
DEPARTMENT OF LABOR  
**DIVISION OF OCCUPATIONAL SAFETY**  
OCCUPATIONAL HYGIENE / INDOOR AIR QUALITY PROGRAM  
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## INFORMATION ABOUT MOLD AND INDOOR AIR QUALITY

Mold is a normal component of our natural environment. To most people it is harmless and at worst a nuisance. Certain molds have even been found to have a positive (antibiotic) effect (e.g. Penicillin). However, some people can become sensitive (allergic) to specific molds and/or classes of fungi. Clearly the most common type of exposure concern is for and among people who are asthmatic, allergic or prone to hypersensitivity pneumonitis since these individuals may react regardless of the amount of mold present.

### ASSESSMENT

All that is needed for microbial growth to occur is a substrate, nutrients, warmth, and moisture. Wood, paper, some carpets and carpet backings, wallboard and other building materials and furnishings act as both substrate and nutrient. Substrates are surfaces that will trap nutrients such as dead skin cells, food crumbs, dust, dust mites, animal dander, dead insect parts and soil. This "dirt" can also contain the spores and "seeds" for such common microbiological contaminants as molds, fungi, mildews and bacteria. **Sufficient moisture** and adequate time for growth are often the final ingredients. Light is not always necessary and only moderate warmth (temperatures slightly above freezing) is required. These fungi have been around for a long time and have become adapted to all types of environments and conditions.

After an increasing frequency of visits involving concerns about mold, this program has examined the issue of sampling for mold and other biologicals. We have reviewed the literature and consulted with experts in the field. This has caused the development of a general policy that this agency does not sample for microbials, nor, does it recommend that such sampling be done. This is also in agreement with the recommendations of the Bioaerosol Committee of the American Conference of Government Industrial Hygienists (ACGIH). Principles among the reasons leading to this decision are:

1. Microbiological air monitoring typically reports results as a number of Colony Forming Units (CFUs). CFUs are the number of live or growing colonies. However, these numbers will mean little to people who are asthmatic, allergic or have hypersensitivities. Sensitive individuals will react to the protein containing residue of mold and other biologicals that lie in the dust.
2. There are no standards against which sample results can be interpreted. Therefore, it would be impractical to sample for them as little useful information can be gained and/or usefully applied. Simply knowing the number of CFUs does not provide information on the relative safety of any area that is evaluated.

3. While there are a wide variety of sampling protocols and methods available to test for microbiologicals, there is no one set method of evaluation. In addition, environmental molds do not lend themselves to the more familiar "medical type" testing, since it depends upon culturing with standard methods and conditions. The environment and the food that is available can change both the color and shape of the colonies. These are key to the identification of the mold. The same factors can also produce sterile or non-reproducing colonies. These also may be missed in testing that focuses upon "live spores" or "colony forming units".
4. As with all plants, the life cycle of molds varies with the season. It is not uncommon to have high levels of CFUs reported both indoors and outside during the growing season. The reproductivity of molds also varies from day to night.

## **RECOMMENDATIONS**

It is with all of the above in mind that, the following recommendations can be offered:

- 1) Carpets, when present, should be subject to regular (daily) cleaning using one of the relatively new high efficiency (HEPA like) vacuum cleaners. During this daily cleaning, look for water damage. Carpet should also be cleaned professionally on a periodic schedule (every six months), or, whenever excessively soiled. The preferred method for cleaning carpets is steam (hot water) extraction, followed by immediate and thorough drying with sufficient ventilation to accommodate the successful completion of the process. A preference for solid surface materials or carpet tile is felt by this agency, when carpet is to be replaced.
- 2) Attempt to identify areas of concern by visual inspection. Additional information can be gathered by smelling the area(s) for the characteristic odors associated with mold. The ventilation system should also be examined in a similar way.
- 3) Eliminate all sources of water. All leaks should be fixed. Excessive humidity can often be removed and/or controlled with dehumidifiers.
- 4) Where mold contamination is suspected, many experts in the field feel it is simple and thorough enough to say "if you can see mold or smell mold, clean and/or decontaminate it." Cleaning and/or decontamination of surfaces can include any and all of the following:
  - a) Wash solid surfaces and launder all fabric based materials, which may have been exposed, with hot water and detergent.
  - b) Dry immediately and completely (exposure to strong sunlight is helpful during this process).
  - c) Decontamination is best done by using a solution of 1 part household bleach and 9 parts of water. This should be left to air dry.
  - d) Materials that can not successfully survive the above cleaning and/or decontamination should be replaced. However, the areas left behind should be decontaminated before replacement materials are installed. Areas of replacement, that then need painting, can best be painted with paints which have mold inhibitors included. This information is usually included on the label.
- 5) Any water damaged porous materials (e.g. ceiling tiles, carpet and wallboard) that cannot be dried out and cleaned within 48 to 72 hours should be removed and replaced. Bacteria and mold can begin to grow within this period of time.

If you have additional questions, or, if you need further assistance, do not hesitate to call this office.